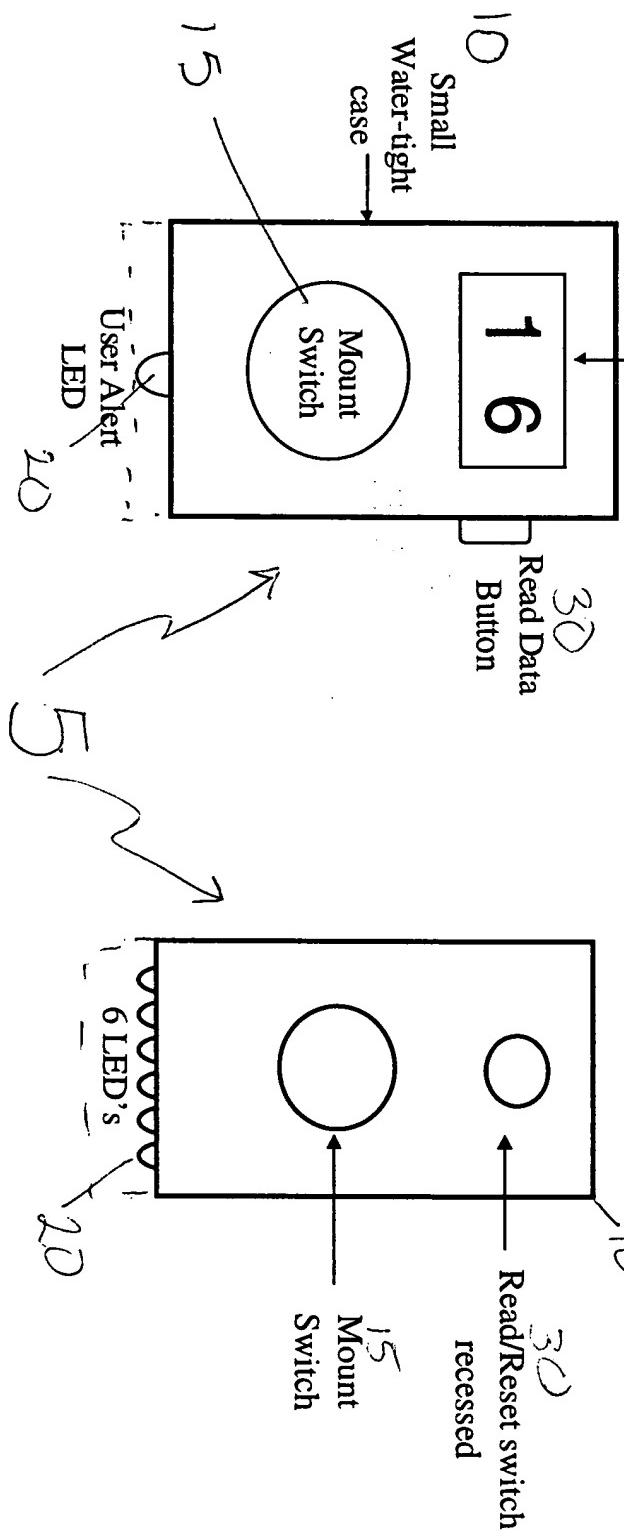


Mount Count Design

- Two versions are currently being considered
 - 2-digit display version
 - Estimated Parts Costs (1000's):
 - \$9 F18.1 25 2 Digit Display
 - \$7 F18.2 30 Read Data Button

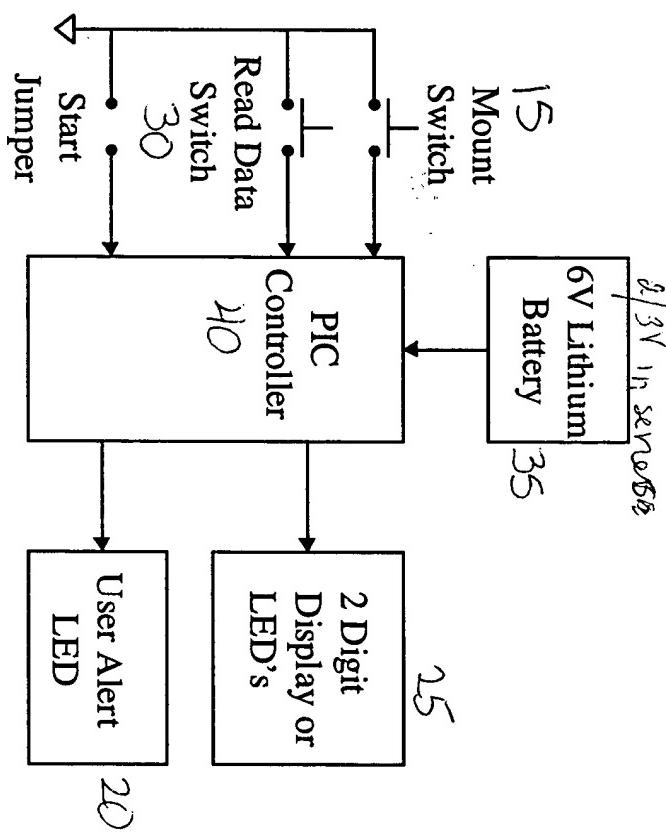


Confidential

Mount Count Block Diagram

- Simple, low parts count design provides:
 - Low cost to manufacture
 - Reliability

Fig 3



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DDX, Inc.

Patent Considerations:

The patent issued in January, 1987 (Patent Number 4,635,587) is titled "Method and apparatus for detecting standing heat in cattle." The pertinent claim in this patent is as follows, with the critical parts bolded.

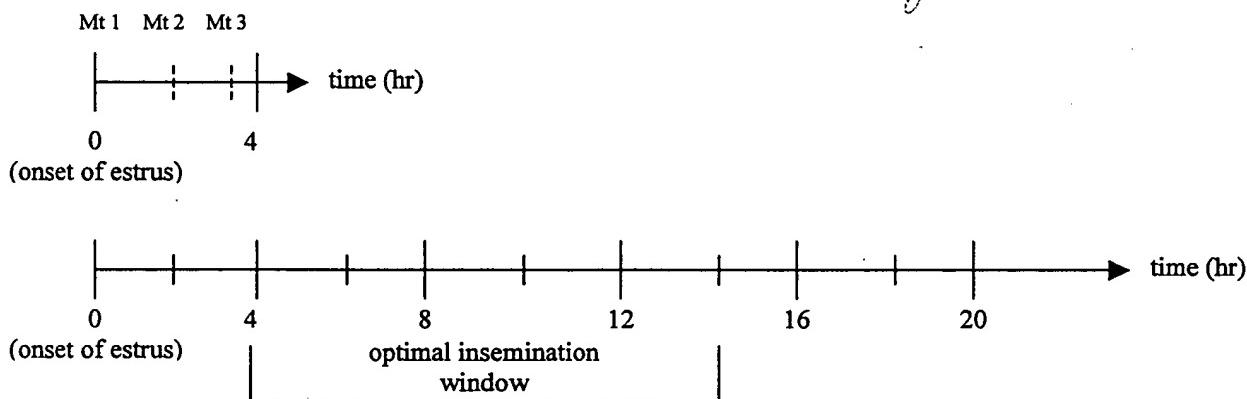
"A self-contained apparatus for detecting the onset of estrus in cattle, including:

a pressure responsive switch disposed to be actuated by mounting of the cow, timer means connected directly to said switch means for activation thereby in count up fashion, digital readout means connected to said timer means and disposed to display the elapsed time after mounting of the cow, audible and visible signaling means connected directly to said timer means to emit a warning signal in response to activation of said timer means, means for securing said pressure responsive switch, said time means, said readout means, and said signaling means together in closely adjacent fashion to the base of the tail of a cow; said means for securing including means for displaying said elapsed time directly from the apparatus secured to the cow, and said means for securing further including means for emitting said audible and visible warning signals directly from the apparatus secured to the cow."

My interpretation of this patent leaves several areas in which the proposed design is not covered.

1. The proposed timing is from determination of estrus, not the onset of estrus. For example, the patent does not teach about algorithms to determine the actual estrus event, but simply teaches that the first mount indicates the initiation of mounting and starts the timer. With Dr. Nebel's research results in insemination timing, the optimal breeding window is 4-14 hours after onset of estrus. With an algorithm of 3 mounts in 4 hours to determine estrus, this optimal window will not be jeopardized (see Figure 3).

Figure 3. Estrus determination algorithm and optimal insemination timing. *Fig. 4*



In one extreme case, the 3rd mount in 4 hrs would occur exactly on the 4th hour, i.e., 4 hours following onset. Therefore, the mount counter would indicate the determination of estrus 4 hours after the actual onset. The optimal insemination window would simply change from 4-14 hours following onset to 8-18 hours following determination. In the other extreme, the 3rd mount in 4 hrs would occur almost immediately after the 1st and 2nd mounts, making the determination of estrus almost coincide with the onset. Therefore, the optimal insemination window would remain at 4-14 hours following determination. Using the union of these extremes, the optimal window for insemination using "determination" would be 8-14 hrs.

2. The proposed algorithm for determining estrus would be x mounts in y hours, thus providing a means for elimination of false, non-estrus related mounts.
3. The proposed design would not only display the time from the determination of estrus, but also the accumulated number of mounts.

25

Display; Number of mounts.
Time since estrus detection(Hrs)
Number of uses left.

30

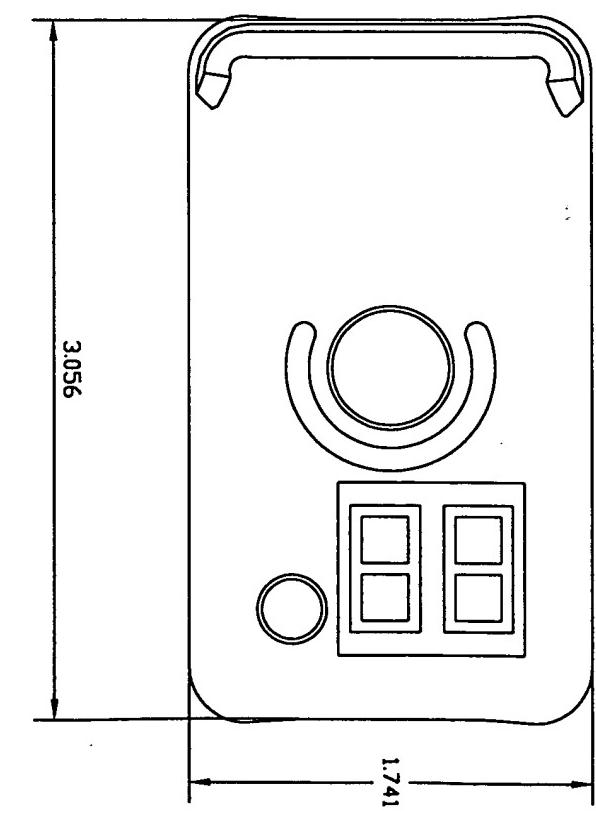
Read/Reset
Switch

10

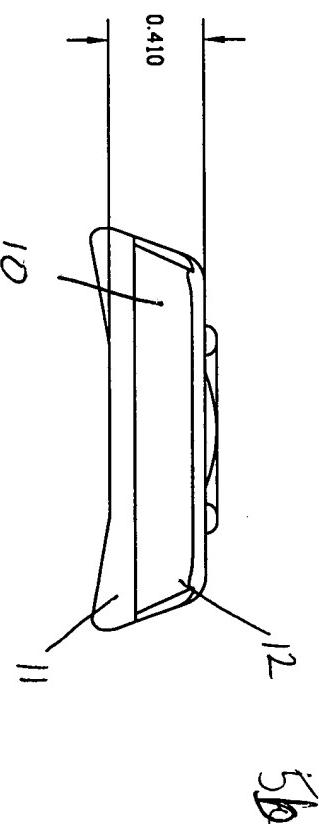
15

Mount Switch

Illuminated area, visual mount detection. 20



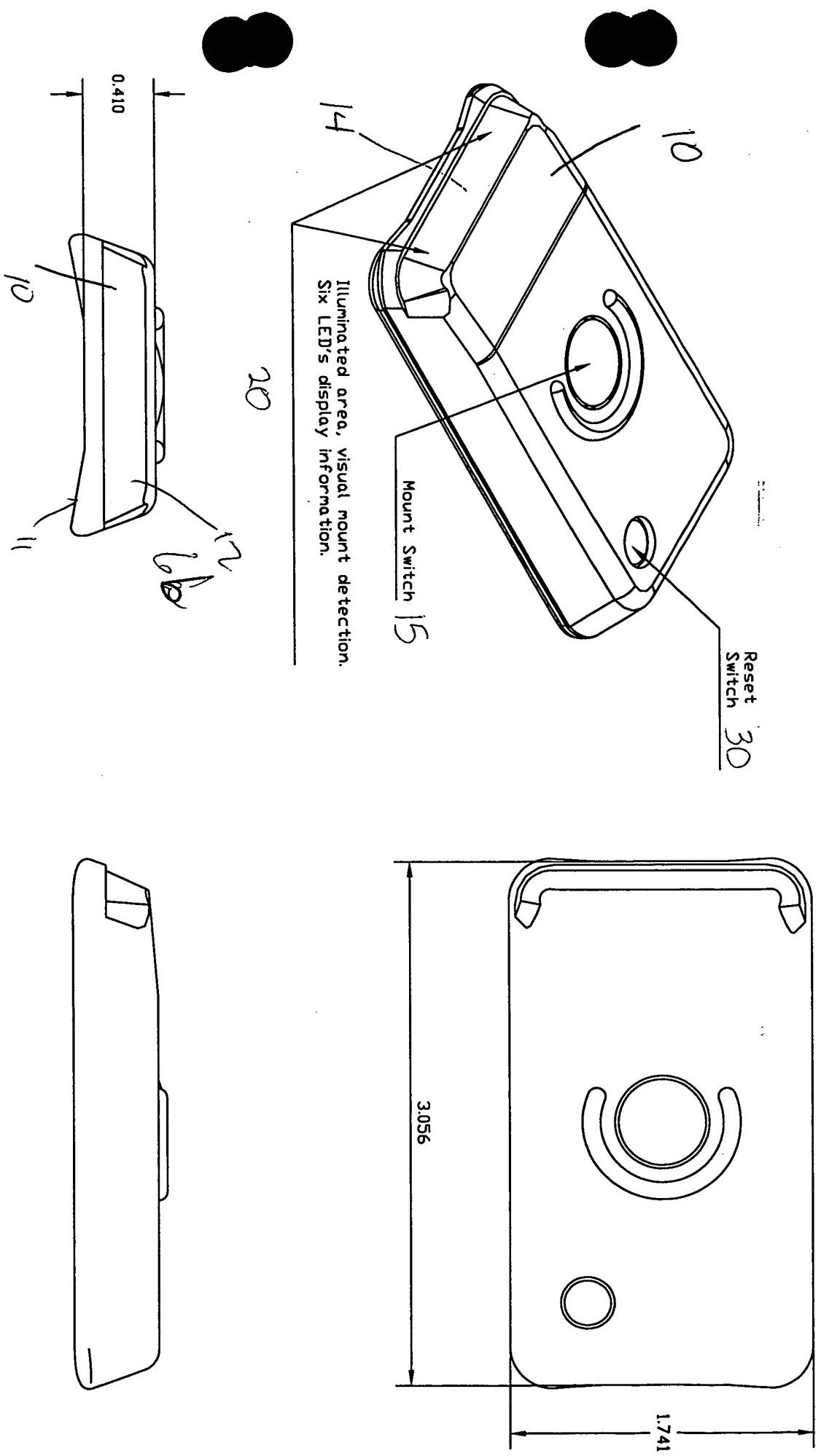
50



Mount Counter with Display

Fig. 5

Mount Count w/o Display Six Information LEDs



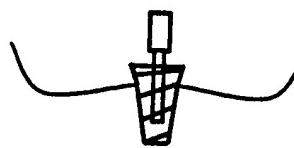
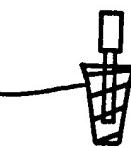
Sketch of Top View

Pin Bones

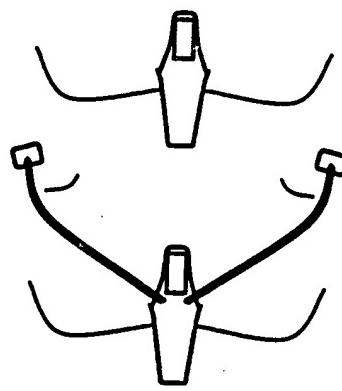
ons

Tail Head

idea
ons
: system



b

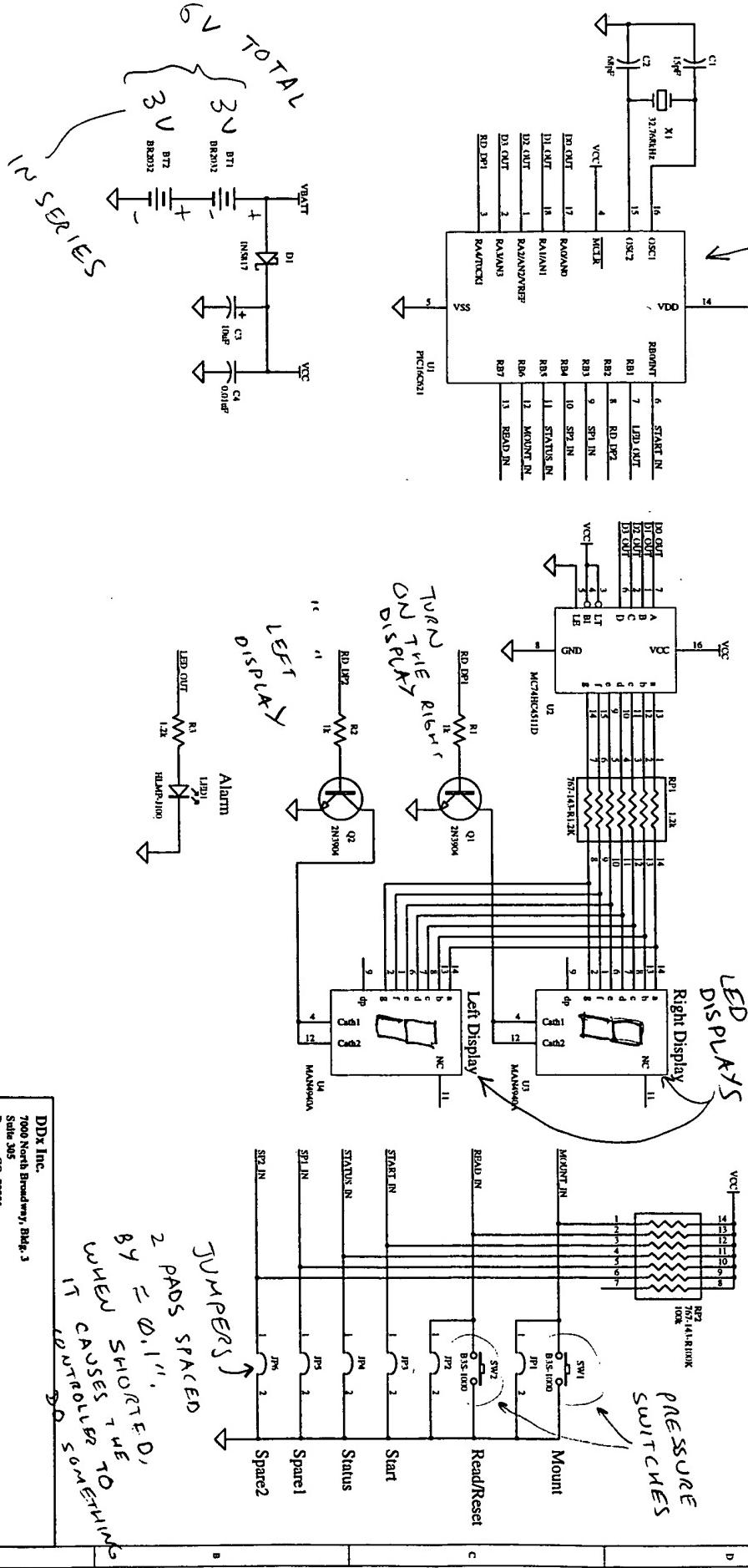


c

d

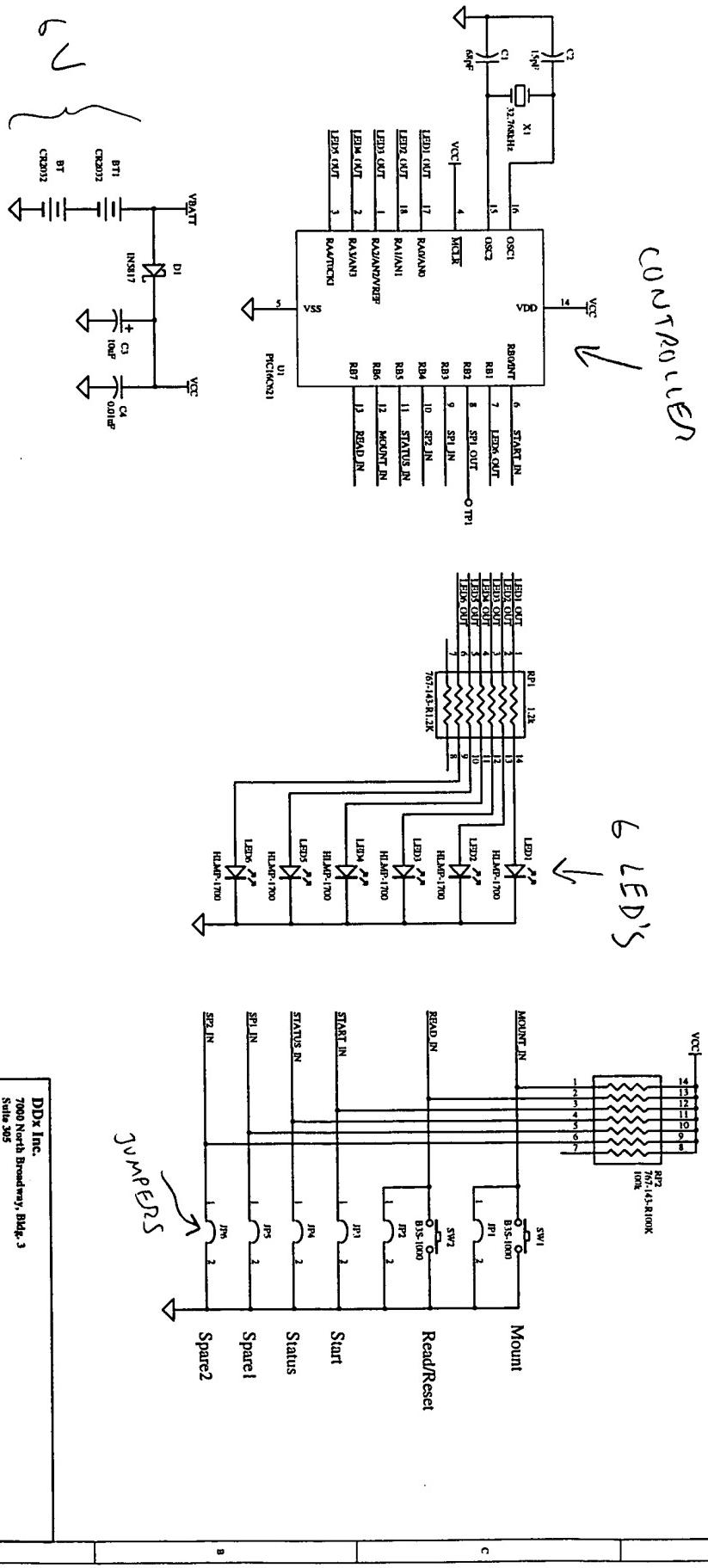
PRINTED CIRCUIT BOARD

Mount Count | Schematic Diagram Key - CONTROLLER OF PCB LAYOUT



Mount Count 2 Schematic Diagram Rev -

For Tree PC3



MountCount Operating Instructions

MountCount™ Description and Operating Instructions

Copyright 1999, DDx, Inc

Author: Tom Ebbin

Date: 7-28-99

The MountCount™ Unit by DDx, Inc.

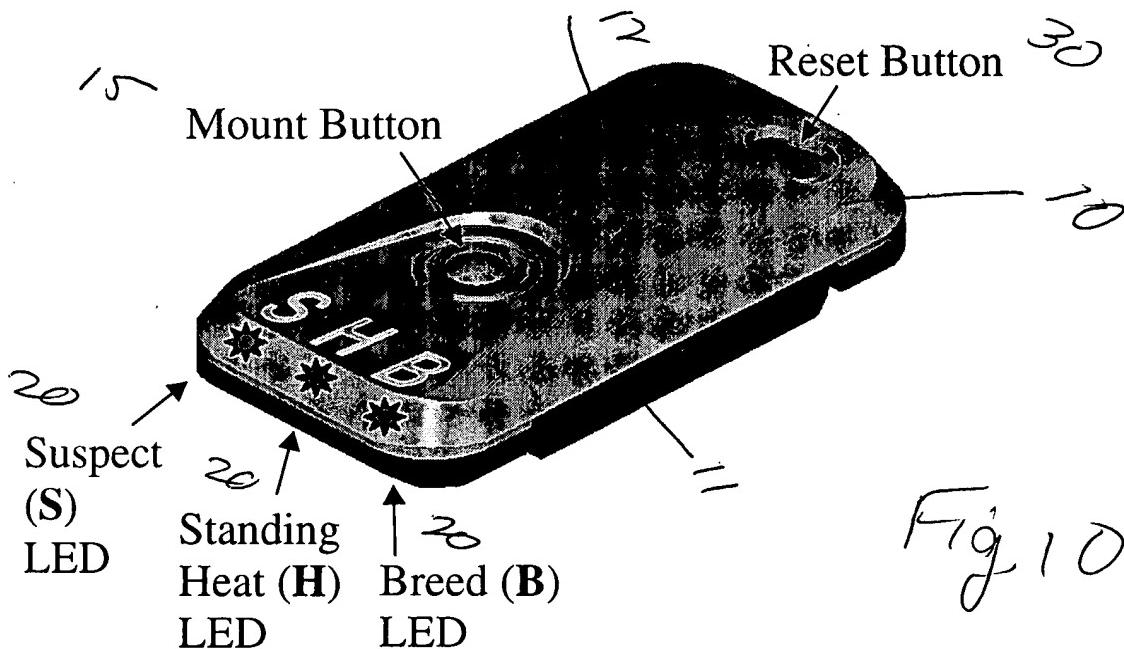


Figure 1. MountCount™ Unit top view

The MountCount™ Unit (MCU) shown in Figure 1 is an electronic device for the purpose of detecting estrus in the bovine species. It provides the user with visual indicators of when the animal is in heat, which substantially improves the chances of successfully breeding the animal. Standing heat in cattle has proven to be one of the most reliable means of determining the onset of the estrus cycle, which accurately predicts when ovulation occurs. Standing heat is defined by standing mounting activity where one animal mounts the tailhead of the animal in heat. The mounting activity is characterized by a substantial and consistent amount of pressure placed on the tailhead for short periods (seconds) of time. The MCU consists of a battery-powered electronic circuit board housed in a watertight case, which is attached to the tailhead of the animal in heat. The mounting activity is detected by a button, which is carefully designed to activate an electronic switch located on the circuit board. A sophisticated microprocessor senses the switch closure every time there is a mount, and performs mathematical computations to determine the state of the estrus cycle. The microprocessor then alerts the user of the estrus state by flashing high-intensity light emitting diodes (LED's) visible through the end of the case. In short, the MCU was designed to make the job of the breeder very easy – they simply need to observe when the Breed LED is flashing to know when to breed the animal.

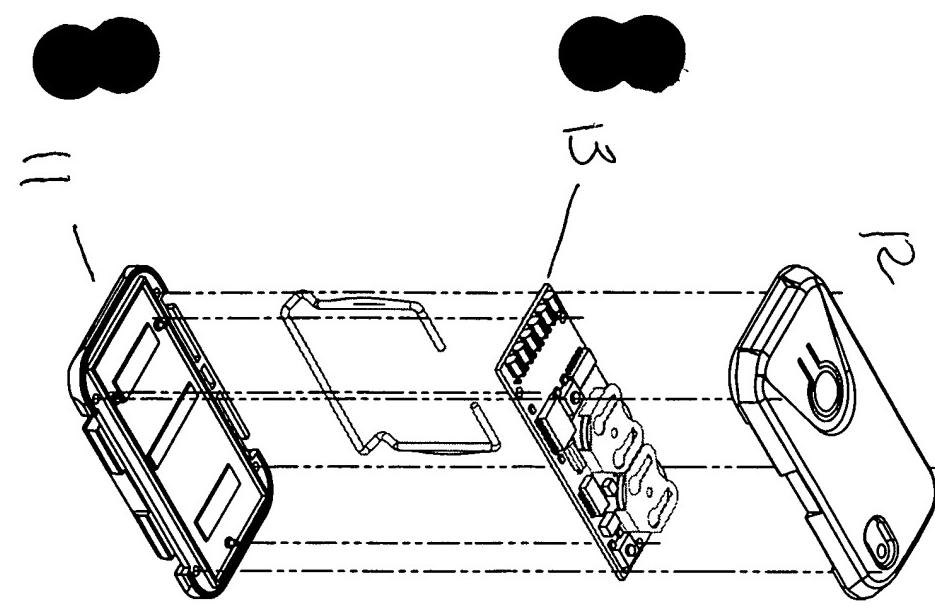
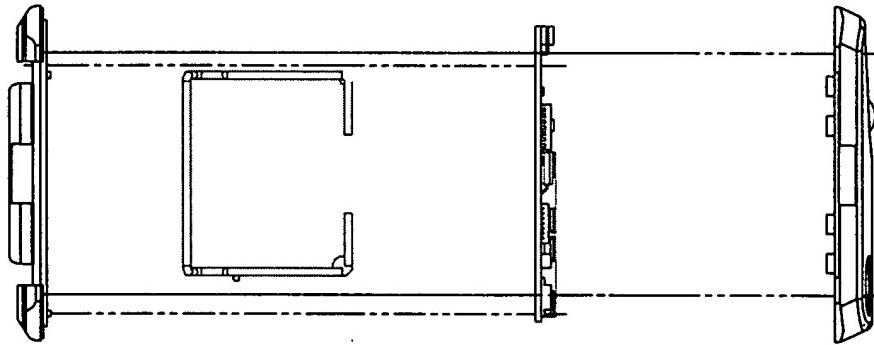


Fig. 11



ITEM	REF.	QTY.	DESCRIPTION	REMARKS	APPROVED
<i>NOTES: OPERATING POSITION INDICATIONS AND TOLERANCES ARE IN DRAWING FIG. 11</i>					
1	REF. A	1	SCREW		
2	REF. B	1	SCREW		
3	REF. C	1	SCREW		
4	REF. D	1	SCREW		
5	REF. E	1	SCREW		
6	REF. F	1	SCREW		
7	REF. G	1	SCREW		
8	REF. H	1	SCREW		
9	REF. I	1	SCREW		
10	REF. J	1	SCREW		
11	REF. K	1	SCREW		
12	REF. L	1	SCREW		
13	REF. M	1	SCREW		
14	REF. N	1	SCREW		
15	REF. O	1	SCREW		
16	REF. P	1	SCREW		
17	REF. Q	1	SCREW		
18	REF. R	1	SCREW		
19	REF. S	1	SCREW		
20	REF. T	1	SCREW		
21	REF. U	1	SCREW		
22	REF. V	1	SCREW		
23	REF. W	1	SCREW		
24	REF. X	1	SCREW		
25	REF. Y	1	SCREW		
26	REF. Z	1	SCREW		
27	REF. AA	1	SCREW		
28	REF. BB	1	SCREW		
29	REF. CC	1	SCREW		
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33	REF. GG	1	SCREW		
34	REF. HH	1	SCREW		
35	REF. II	1	SCREW		
36	REF. JJ	1	SCREW		
37	REF. KK	1	SCREW		
38	REF. LL	1	SCREW		
39	REF. MM	1	SCREW		
40	REF. NN	1	SCREW		
41	REF. OO	1	SCREW		
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45	REF. SS	1	SCREW		
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